REMARKS/ARGUMENTS

Claims 1-15, 18-22, 29-35, 40 and 41 remain in this application. Claims 16, 17, 23-28 and 36-39 have been canceled.

Antecedent support for the amendment to Claim 1, and for new Claims 40 and 41 is found on page 9, line 14 and page 9, lines 11-13.

The Examiner has rejected Claims 1-12, 14, 18-20 and 29 as being unpatentable over Hara in view of Faghri. Applicants respectfully traverse this rejection.

Referring to Hara, there is disclosed a group robot system, and sensing robots and base station used therefor. Hara teaches a group robot system in which a number of robots operate collectively. See column 1, lines 8-10. Hara teaches the group robot the system consists of a base station, a plurality of fluttering sensing robots and a plurality of fluttering pheromone robots, as shown in figure 1. Figure 7 shows the relationship between the position and hierarchical structure in communication between each of the sensing robots and between the sensing robot and the base station in the group robot system. See column 12, lines 54-64.

Claim 1 of applicants has the limitation that "each of the N vehicles unaware of their respective position and orientation and not in communication with each other". Hara does not teach or suggest this limitation. Hara requires that the plurality of robots have a hierarchical structure and are in communication with each other. In fact, because Hara requires that the plurality of robots are in communication with each other, Hara teaches away from applicants' claimed invention where the vehicles are not in communication with each other.

Hara teaches that the sensing robots are essentially autonomous, that is, not guided by the base station. The sensing robots are preprogrammed to move essentially concentrically about the base station. Thus, the sensing robots have their movement essentially only constrained by staying within a predetermined distance from the base station, and moving concentrically. Hara teaches that when a sensing robot detects an object, position information and the like are transmitted to the base station. Based on the transmitted information, the base station starts free movement toward the object. As the base station moves, sensing robots positioned approximately concentrically also move toward the object. A sensing robot closer to the base station has higher spatial resolution. Therefore, as the base station comes closer to the object, accuracy of position detection for detecting the object or sensing information related to the size of the object that is to be transmitted to be the base station, becomes higher. See column 14, lines 1-14.

Besides the fact that each of the robots are aware of their respective position and orientation in communication with each other, as explained above, the base station is not communicating movement commands to the objects to control the objects movement. The robots, on their own, detect the position of the base station and where they are relative to the base station, and maintain the desired position from the base station based on their own commands determined from knowing where the base station is located relative to them, and not commands from the base station.

Referring to Faghri, there is disclosed a computer implemented system and method for simulating motor vehicle and bicycle traffic. Since Faghri is completely directed to a computer implemented system and method, there are absolutely no physical objects, as found in amended Claim 1. It is respectfully submitted that Faghri has nothing to do with applicants' claimed invention, as amended. A computer simulation of motor vehicles has nothing to do with the manipulation or control of physical objects.

Furthermore, Claim 1 of applicants has the limitation that each of the N objects is unaware of their respective position and orientation and not in communication with each other. Faghri specifically teaches that the simulation uses a motor vehicle following model. Specifically, in car following situations, the behavior of vehicles as they follow one another is applied. The response of a driver seems to be affected by the relative speed of his car and the one ahead. Thus, the relative speed corresponds to the stimulus in the function. The driver sensitivity is inversely proportional to the distance headway. The model in Faghri uses the equation on column 8, line 15. See column 7, line 65-column 8, line 30. Accordingly, not only does Faghri fail to teach or suggest, and really has nothing at all to do with physical objects, but Faghri also does not teach or suggest each of the N objects unaware of their respective position and orientation and not in communication with each other., since the car following model requires a given vehicle being communication with a vehicle immediately had of it.

It is respectfully submitted that since Faghri is a self-contained simulation, with no physical objects whatsoever, in fact, every object in the model of Faghri knows it's respective position and orientation and is in communication with each other because they all are part of the same software code. Thus, the computer which runs the software that contains the model is the only physical object and has full knowledge of all the data associated with the program in its memory. Furthermore, in column 4, lines 57 and 58, Faghri specifically teaches that these "vehicles interact with other vehicles". To interact requires these vehicles to be aware of each other and of their respective position and orientation. Thus, even Faghri, does not teach the N objects are unaware of their respective position and orientation and not in communication with each other, as found in applicants' claimed invention.

The Examiner is essentially taking the position that the simulation taught by Faghri could somehow or other be modified to receive outside data which would replace the simulated entities of the model, and instead control the robots of Hara, in the same way as claimed by applicants.

However, it is respectfully submitted this is an enormous, let alone probably impossible, leap to make. There is no capability in the model by Faghri how to control an object, such as an actual motor or wheels or any type of mechanism that moves a physical object. For instance, in applicants' preferred embodiment, for enablement purposes, applicants teach that turning is achieved by differential steering, whereby vehicle rotational rate is dictated by the difference in the velocity of the wheels. See column 16, lines 18-20. Faghri does not even consider such a capability (and does not need to), and Hara certainly does not do this because the base station does not specifically give motion commands to the robots.

There is no teaching or suggestion to combine these references. Each reference is totally distinct and has a different purpose and solves a different problem from the other. There must be some teaching or suggestion to combine these references, and here there is none.

Furthermore, to combine these references would require a total reengineering, significant research and design to somehow or other take the simulation of Hara and convert it into operating real-world physical objects. In addition, the system taught by Hara also has to be totally redesigned for the base station to be able to give motion commands to the robots, and the robots would not be able to operate by knowing where each other are located. This material redesign and redevelopment only supports the finding of nonobviousness.

Furthermore, it must be stressed that the only reason that the Examiner is combining these two references, is because of hindsight. The Examiner is using the limitations of applicants' claims as a roadmap, to find the different limitations in disparate references, and supposedly having found them, concluding that applicants' claimed invention is arrived at. This is not patent law. Hara has no need of a simulator (Faghri) and Faghri has no need of search robots (Hara).

Moreover, it is respectfully submitted that because Faghri deals only with a simulation, it is non-analogous art and cannot be cited against applicants' claimed invention.

The Examiner is also reminded that teachings cannot be taken out of the context in which they are found. The context of Hara is the robots must be able to communicate with each other to perform their primary purpose. The context of Faghri is a computer simulation.

Accordingly, Faghri in view of Hara does not teach or suggest the limitation in Claim 1 of "N physical objects . . . each of the N is objects unaware of their respective position and orientation and not in communication with each other"; and Claim 1 is patentable.

Claims 2-9 and 29 are dependent to parent Claim 1 and are patentable for the reasons Claim 1 is patentable.

Claim 10 is patentable for the reasons Claim 1 is patentable. Claim 11 is dependent to parent Claim 10 and is patentable for the reasons Claim 10 is patentable.

Claim 12 is patentable for the reasons Claim 1 is patentable. Furthermore, the LEDs of Hara are for visible illumination of other objects (e.g. detecting an intruding human) not for sensing the location of robots. See column 39, lines 20-27 and column 41, lines 30-45.

Claim 14 is patentable for the reasons Claim 1 and Claim 12 are patentable.

Claim 18 is patentable for the reasons Claim 1 is patentable and Claim 12 is patentable.

Claims 19 and 20 are dependent to parent Claim 18 and are patentable for the reasons Claim 18 is patentable.

The Examiner has rejected Claims 13, 15, 22 and 30-35 as being unpatentable over Hara in view of Faghri and further in view of Storlie. Applicants respectfully traverse this rejection.

Referring to Storlie, there is disclosed a media edge sensor utilizing a laser beam scanner. Storlie teaches a laser printer 10 which includes a laser scanner mechanism 12. A media sheet 18 (paper) is propelled along imprinting pathway 16 by rollers 20 and 22. A scanned beam 23 from laser scanner mechanism 12 contains modulation information for imprinting images on paper 18. See column 2, lines 54-63.

Storlie teaches that optical sensors 40 and 42 are positioned beneath media sheet 18 when it is positioned and in printing path 16. Optical sensors 40 and 42 are only partially shaded by sheet 18 and provide signals indicative of the incidence of beams 36 and 38, respectively, to a microprocessor 44. In essence, each of optical sensors 40 and 42 provide a high output to microprocessor 44 during the time the beams 36 and 38 are respectively incident thereon. By measuring the pulse lengths of the outputs with optical sensors 40 and 42, microprocessor 44 can determine the width of a media sheet 18 and whether it is off set from the center line of imprinting path 16. See column 3, lines 15-28.

Claim 13 has the limitation of "a planar element on which the N objects are disposed, and wherein the sensing means includes at least two 1-D sensors that sense the light emitted from the edge of the planar element on which the objects are disposed". It is respectfully submitted by applicants that the only planar element that Storlie teaches is a piece of paper. There is no teaching or suggestion that anything is disposed on this piece of paper. Storlie is teaching a scanner and specifically how to impart an image onto the piece of paper. The light that is taught by Storlie is not emitted from the edge of the planar element, but from a laser 26 that is separate and apart from the piece of paper, as is easily seen in figure 2 and 3. This light is used for an alignment of the piece of paper, that is the alignment of the planar element. Accordingly, Storlie

does not teach a planar element upon which the objects are disposed, nor does Storlie teach to sense light emitted from the edge of the planer element. Furthermore, Storlie does not teach or suggest each object having an emitter which emits a light, each of the N objects unaware of their respective position and orientation and not in communication with each other, as found in Claim 12. Accordingly, Storlie does not add anything to the teachings of Faghri and Storlie in relevant part to arrive at Claim 12 of applicants. Claim 13 is dependent to parent Claim 12 and is patentable for the reasons Claim 12 is patentable, as well is for the reasons explained above.

Claim 14 is patentable for the reasons Claim 12 is patentable. Claim 15 is dependent to parent Claim 14 and is patentable for the reasons Claim 14 and 13 are patentable.

Claim 18 is patentable for the reasons Claim 12 is patentable. Claim 22 is dependent to parent Claim 18 and is patentable for the reasons Claim 13 and Claim 18 are patentable.

Claims 30 and 31 are dependent to Claim 22 and are patentable for the reasons Claim 22 are patentable.

Claims 32 and 33 are dependent to parent Claim 13 and are patentable for the reasons Claim 13 is patentable.

Claims 34 and 35 are dependent to parent Claim 15 and are patentable for the reasons Claim 15 is patentable.

The Examiner has rejected Claim 21 as being unpatentable over Hara in view of Faghri and further in view of Kanayama. Applicants respectfully traverse this rejection. The only reason the Examiner has cited Kanayama is supposedly because it teaches vehicles capable of holonomic motion. However, Kanayama does not add anything to the teachings of Faghri and

Hara to arrive at the limitations of Claim 18. Claim 21 is dependent to parent Claim 18 and is patentable for the reasons Claim 18 is patentable.

In view of the foregoing amendments and remarks, it is respectfully requested that the outstanding rejections and objections to this application be reconsidered and withdrawn, and Claims 1-15, 18-22, 29-35, 40 and 41, now in this application be allowed.

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